

THE DEPARTMENT OF EDUCATION

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LESSONS IN AGRICULTURE

CIRCULAR 13D

A SUPPLEMENT TO NO. 1 SCHOOL CHART 13D

ALFALFA OR LUCERNE



A School Garden in Grey County.

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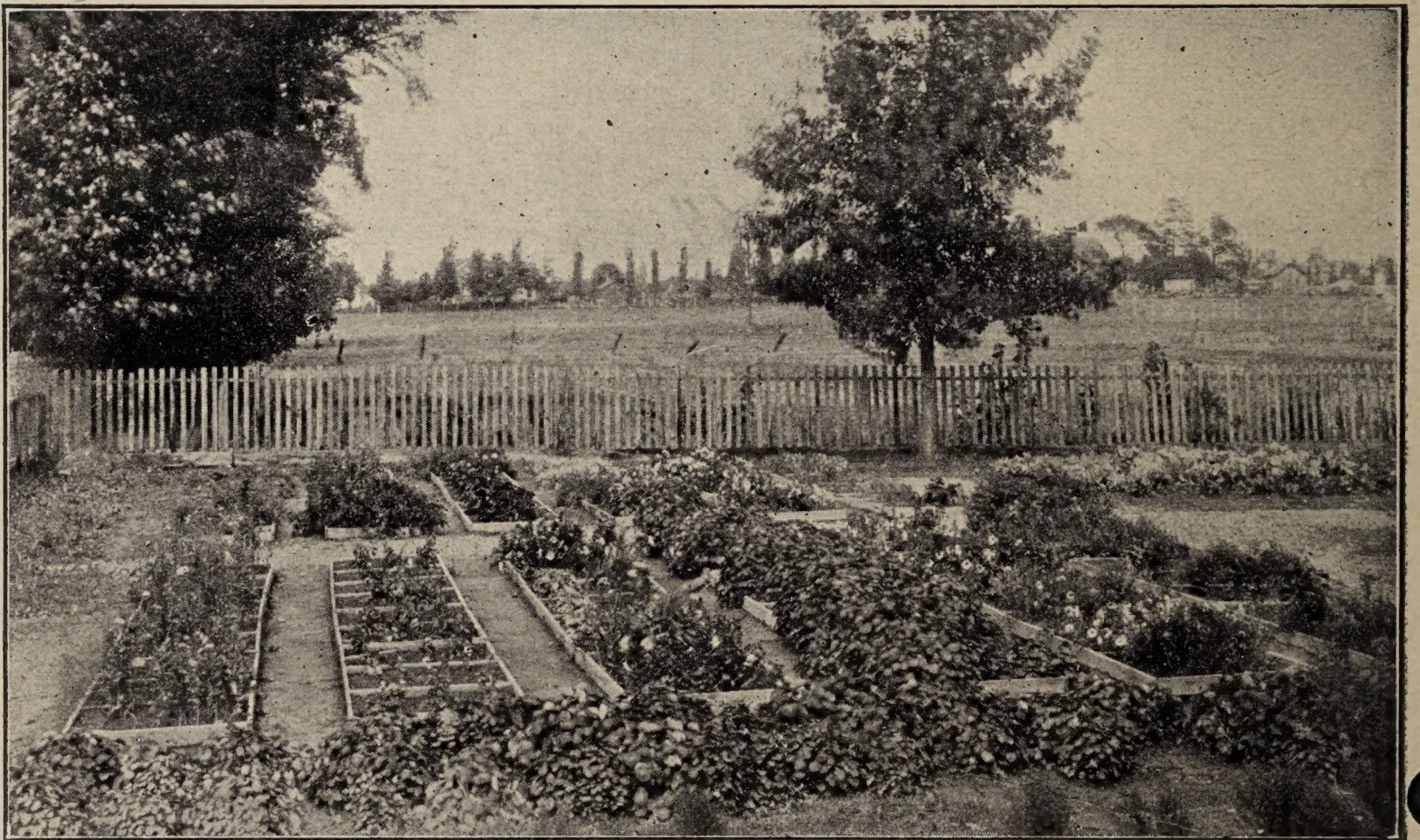
TORONTO

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1912.

A SCHOOL EXPERIMENT ON ALFALFA OR LUCERNE

The Place of Alfalfa in Ontario Agriculture.—There are many indications that the growing of alfalfa in Ontario will increase greatly in the near future. It has already won much favour in many parts of the Province. During the past forty years it has been gradually establishing itself in Welland, Lambton, Lincoln, Haldimand and other counties in the Western Peninsula. In 1871 Mr. Bethel, a farmer, near Thorold, in Welland-County, secured two pounds of seed from Lorraine, France; the offspring of this seed is now represented in many of the alfalfa fields in the Niagara Peninsula. In other places in the eastern and central counties its cultivation has been spreading as well, so that it is now known that it can be grown generally throughout the Province.



A School Garden in Wentworth County. S. S. No. 3, Barton Tp.

While there may be difficulties in securing a *catch* or extra care required in making the hay, these are more than balanced by the permanency of the plant, the high feeding value of the hay, and the abundance of green fodder available when pastures are poor; it is often spoken of as the farmer's "best mortgage lifter." All kinds of farm stock relish it, not omitting poultry. Dairymen recommend it highly for milk production. On account of the large proportion of protein in it—this is nitrogenous muscle-building food—it may take the place very largely of bran and grain in a *balanced ration*. It is believed that with corn silage and

NOTE.—Extra copies of this Circular will be sent free to schools on application of the teacher for a supply for the upper classes. Address: *Director of Elementary Agricultural Education, Ontario Agricultural College, Guelph.* mentioning the school (number of school district and municipality).



























alfalfa hay the problem of economical feeding of farm stock can be largely solved. The value of its hay as compared with Red Clover and Timothy Hay is shown in the following table, taken from Ontario Agricultural College Bulletin 111. The analyses were made in the Chemical Department at the College:

Constituents of one ton of hay.	Alfalfa	Red Clover.	Timothy.
Protein.....	192.2 lbs.	141.0 lbs.	48.7 lbs.
Fat	30.0 "	29.4 "	16.2 "
Nitrogen Free Extract.....	496.6 "	587.4 "	528.4 "
Fibre	205.5 "	209.4 "	306.9 "

It does not, however, take the place of clover in a short system of rotation; clover growing will always be necessary for this. Alfalfa is sown for a more permanent crop.

Other Names for Alfalfa.—The name Alfalfa is of Arabic origin and means the "best fodder plant"; this was the name adopted by the Spaniards. The name Lucerne has come to us from the French. On account of the similarity of its leaves to those of the clovers it has been called a clover. The plant is known by several different names, such as French Clover, Chilian Clover, Burgundy Clover, Brazilian Clover, Snail Clover, Great Trefoil and Spanish Trefoil; it is also called Medic and Purple Medic.

Pure Seed.—It is very desirable that all seed sown on our farms should be as clean, strong and pure as possible. To secure this the *Seed Control Act* has been passed by the Dominion Parliament defining the different grades that may be sold as seed. The diagram below indicates these grades and shows the seeds of the worst weeds; these have been specially designated as *noxious weeds*.

STANDARDS OF QUALITY of ALFALFA SEED			NOXIOUS WEED SEEDS COVERED by the SEED CONTROL ACT of 1911														
Grade of Seed	Total Weed Seeds Permitted in 100	No. of Noxious W.S. Permitted in 100	WILD OATS (<i>Avena sativa</i> L.)	COMMON DARNEL (<i>Securidaca burgetiana</i> L.)	POCKS (<i>Stellaria media</i> L.)	WHITE COCKLE (<i>Lupinus albus</i> L.)	POCKET FARMER (<i>Stellaria media</i> L.)	BLADDER CAMPION (<i>Commelina arvensis</i> L.)	PURPLE COCKLE (<i>Agrostis alba</i> L.)	WILD MUSTARD (<i>Brassica arvensis</i> L.)	TUMBLING MUSTARD (<i>Sinapis alba</i> L.)	WILD CARROT (<i>Daucus carota</i> L.)	FIELD RHINDWED (<i>Eriogonum arvense</i> L.)	DODDER (<i>Cuscuta</i> sp.)	BLUE BUE (<i>Lupinus albus</i> L.)		
Extra No.1.	30	0															
No.1.	100	5															
No.2.	200	20															
No.3.	400	80															

Consult Ontario Agricultural College Bulletin 188, *Weeds of Ontario* for an account of the weed seeds commonly found in Alfalfa seed; there are nearly forty different kinds listed.

Origin of Seed Supplied to Schools.—The seed furnished to the schools through the *Schools' Division of the Experimental Union* for this practical work of Alfalfa growing is the highest grade of Ontario-grown *Ontario Variegated Alfalfa* obtainable. The origin of the seed can be traced to what was probably the first seed that came into Ontario from Europe about forty years ago. Through these years of continuous cultivation it has established itself as well-suited to our climate, and for this reason has been considered as a distinct strain and called Ontario.

The word *variegated* in its name has been used to express another matter regarding its origin; two species of Alfalfa are to be distinguished, viz., Common Purple Alfalfa (*Medicago sativa* L.) and the yellow-flowered Alfalfa (*Medicago falcata* L.). The Ontario Variegated Alfalfa, on account of showing some striking characters of both species in the colour of its flowers, is now considered to be a cross between the two species, and so is called *Variegated*.

Condition and Selection of Soil.—The ground should be in the best possible condition, rich, well cultivated and free of weeds and other plants. As the roots grow to a great depth an open, deep subsoil is desirable. "Alfalfa cannot stand wet feet"; it will not do well in wet land or where the water lies within two feet or so of the surface; on the other hand it will grow through sand, gravel or clay subsoils until it reaches the water level. It does well as a rule on knolls or hillsides. Consult practical Alfalfa growers concerning the best soil and the best location for the school plot. It is generally considered that it may be grown in any part of Ontario on good, well drained land, provided there is a sufficient supply of lime in the soil—and this is generally present except in muck soils.

The Plot.—Select a place for the plot so that it may remain undisturbed for a number of years. Measure it out exactly one rod square and drive strong, neat stakes at the corners. Arrange for good wide paths about the plot, two feet in width if possible.

Inoculation.—As a rule, there is a difficulty in getting a good *stand* of Alfalfa on land that has not been producing Alfalfa. This is on account of the absence of the proper *bacteria* for inducing the growth of the *root-tubercles*. If, however, the land has had Sweet Clover growing on it, special means of *inoculation* will not be necessary. If it is thought necessary to inoculate the plot, scatter a few shovelfuls of clean soil taken from an alfalfa field or a patch of sweet clover over the plot and rake it in well. If such soil is not procurable, the inoculation may be made by treating the seed with the culture prepared by the Bacteriological Department of the Agricultural College.



A School Garden in Kent County.

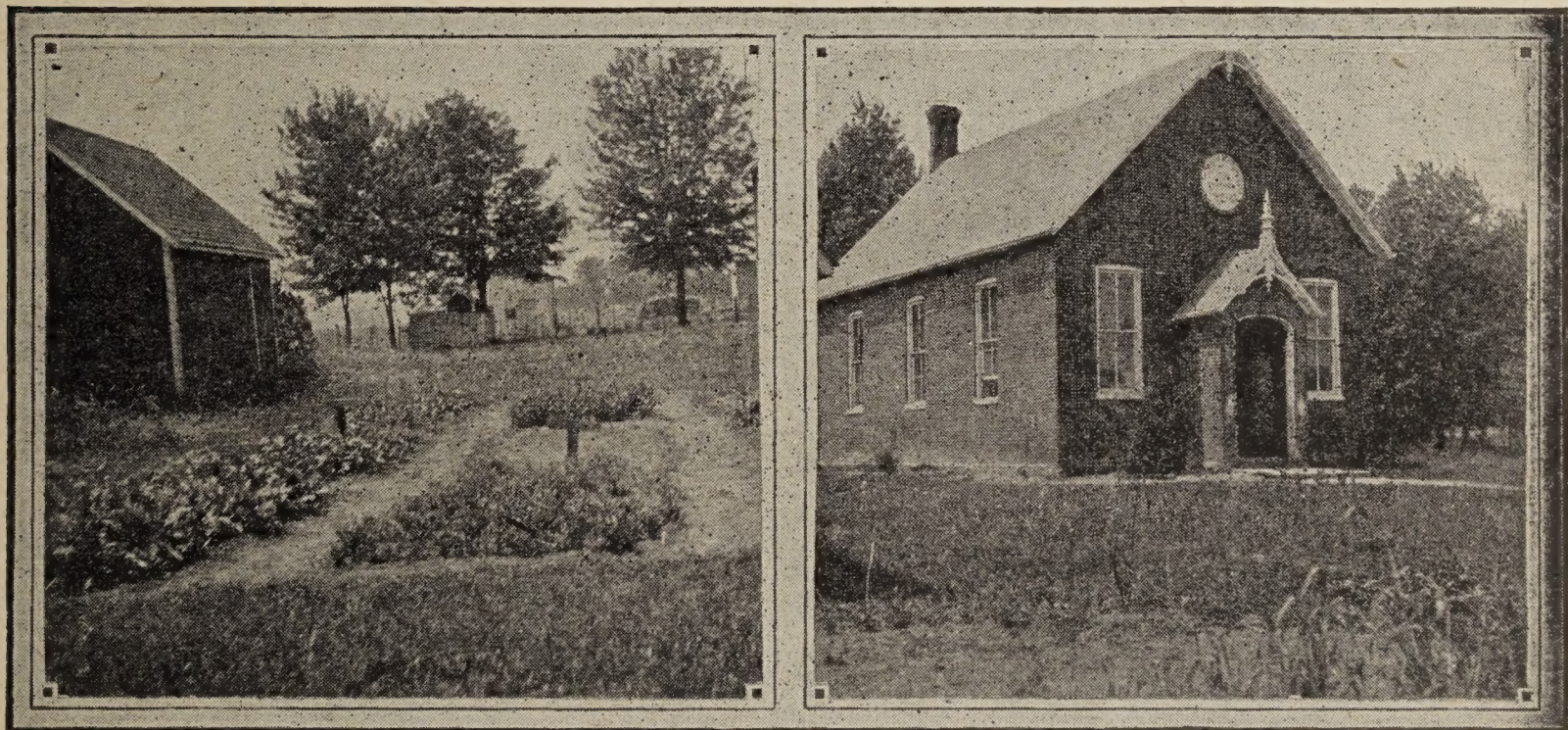
Seeding.—Prepare a very fine seed bed, just as you might for flowers or vegetables. Sufficient seed (2 ozs.) is sent to sow the plot at the rate of 20 lbs. to the acre. It is to be sown with barley at the rate of one bushel to the acre (4 4-5 oz. for 1-160 acre). The barley can be obtained locally. The alfalfa may be sown broadcast or in drills. Cover the seed by raking, firm the earth to insure moisture to it for germination, and leave the surface lightly raked to prevent too great a loss of soil moisture. The depth of planting will depend on the nature and condition of the soil; the seed should be covered deeper in light soils than in heavy ones; when there is abundance of moisture present at the surface it does not need to be planted so deeply as is necessary in drier ground.

Care.—The barley is used as a *nurse-crop* to protect the young and tender Alfalfa plants. It should be cut just as soon as it is ready to harvest; or even cut before this and used for green fodder, if it is retarding the alfalfa's growth.

The weeds on the school plot should be kept pulled. Do not crop the alfalfa the first season unless it grows quite high; in this case the plants may be cut about six inches from the ground. Allow it to go into the winter strong and well-grown. In the second, and subsequent seasons, use the plot for practical lessons in agriculture as suggested below. Do not permit it to be neglected; rather permit some person in the neighborhood to cut the crop regularly for green food for his cow, poultry, horse or pigs

Making Alfalfa Hay.—Henry Glendinning, Esq., of Hastings Co., a gentleman who has had a great deal of experience in making and inspecting alfalfa and other hay, in recommending the following method says: “While it is correct that extreme drying causes the leaves to fall off, my experience is that the more it is handled, if properly done, the more leaves are retained.

“Our method is to cut with two mowers in the forenoon and follow within an hour with the tedder; all of this being done before noon. Ted again in the afternoon and rake into windrows before night. If the weather is favourable let it lay in the windrows over night and the following forenoon ted the windrows lengthways. In the afternoon ted again, and the next morning after the dew is dried off ted again. Then we hitch to the hay loader and haul to the barn. For the past three years we have not put up a coil of alfalfa hay on the farm. This method produces an alfalfa hay that is green and full of leaves.



A School Garden in Kent County.

“By the frequent tedding none of the leaves ever get very dry; they are kept in a wilted condition and the leaf is enabled to perform the function that nature intended it to do, viz., pump the sap out of the stem. If the weather is unfavourable, I prefer coiling the first day after tedding twice.”

PRACTICAL SCHOOL STUDIES

Keeping Records.—It is not expected that all the topics outlined for study below can be covered by any school which undertakes this work. They are given as suggestions merely for interesting practical studies. Perhaps only a very few of them can be taken up as class studies, but many may be suggestive for independent individual work. Whenever any of the work is done, pupils should make careful records of the results of their experiments or observations. Let this leaflet be the commencement of a little “Alfalfa Book.” Add additional sheets for draw-

ings, mountings, newspaper clippings, essays and records of experiments. Put down the work so well that it may be a neat, creditable and permanent account of this part of your studies in *Agriculture*.

Seed Studies.—1. Observe the variations in size, colour and shape of the seeds and compare the Alfalfa seed with the seed of the Clovers, Sweet Clover and Black Medic. Put up collections of these in glass vials.

2. Analyze one ounce of a sample to determine to what so-called "government standard" it grades; or send (post free) samples to the *Seed Branch, Department of Agriculture, Ottawa*, for an official examination and report.

3. Estimate the number of seeds in an ounce and calculate the number of seeds sown on an acre.

Seedling Studies.—1. Observe the time that it takes for the seed to germinate.

2. Compare the first, second and third leaves.

3. Measure the rate of growth from week to week.

4. Prepare mounted specimens of seedlings showing the development at different ages.

5. Observe where, how and when the branching takes place.

6. Note when the tubercles are first noticeable on the roots.

7. Estimate the number of plants established in the plot before winter sets in.

8. Estimate the number of plants that survive the winter.

Plant Studies.—1. Measure the length of the root of a one-year-old plant.

2. Measure the length of roots exposed in digging drains, wells, gravel, sand-pits, etc.

3. Estimate the number of tubercles on the root system of a one-year plant.

4. Study the structure of a flower and compare with a pea blossom.

5. Find out whether bees or other insects visit the flowers to gather nectar.

Compare the work of bumble and honey bees on alfalfa.

6. Note how the plant forms the "crown" at its root.

7. Examine plants for the occurrence of rust and the injury done by this plant disease.

Studies on School Plot.—1. Find the weight of the green crops cut from the plot, and the weight of hay that these yield.

2. Feed the hay to poultry, pigs, sheep, horses and cows, to learn how it is relished.

3. If a crop of seed is produced, thresh the hay, weigh the seed and estimate the yield per acre. Use the seed for distribution in the district.

4. Analyze the seed produced and determine the grade to which it attains.

5. Experiments with the plot—*e.g.*, manure one section of the plot in the fall, or cut another section quite close in the fall; or trample another portion, or allow a portion to remain uncut.

Crop Studies.—1. Make inquiries regarding the history of its introduction into the district, the difficulties encountered and the reasons for success.

2. Make a map of the district marking the Alfalfa fields.

3. Compare the fields as to the length of time they have been cropped, the kinds of soil represented, the yields and the effects of pasturing.

4. Find out how the hay is cured and fed by different farmers.

5. Examine the market reports for prices paid for hay and seed.

6. Get the opinions of practical farmers regarding its value and uses.

Literary Work.—Have a school debate. “*Resolved that Alfalfa is a more desirable crop to grow than Timothy.*” Write compositions on “*How to Grow Alfalfa.*” “*The Uses of Alfalfa.*” “*The School Alfalfa Plot,*” etc.

References.—The agricultural papers very frequently publish articles on Alfalfa. Bulletin 165, *Alfalfa or Lucerne*, published by the Ontario Department of Agriculture. and Bulletin 46, *Alfalfa or Lucerne*, published by the Dominion Department of Agriculture, may be had free on application.

PUPIL’S RECORD

School..... Pupil.....
Teacher

FIRST YEAR

When ground was prepared.....When seed was sown
When seed germinated.....When cover crop was cut
Character of catch.....Condition of crop at beginning of winter.....
Pupils who looked after plot.....
Remarks on how the plot was cared for, etc.....

SECOND YEAR

Condition of plot in spring

Date.	Weight of Green Fodder.	Weight of Hay.	Remarks
First cutting
Second cutting.....
Third cutting.....
Fourth cutting.....
Total

Remarks:—What was done with hay, etc.....

The Department of Education

Ontario

LIST OF PUBLICATIONS RELATING TO ELEMENTARY AGRICULTURE, SCHOOL GARDENS, ETC.

Copies of these publications are sent to all the schools, and teachers should see that they are retained in the school for their own and their successors' reference. Teachers or others will be supplied with extra copies desired for personal use. The circulars marked with an asterisk (*) are for pupils' use; extra copies of these will be sent free to teachers who apply for a supply for the use of their upper classes. Address *Director of Elementary Agricultural Education, Ontario Agricultural College, Guelph*, stating the number of the school and the municipality.

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| Circular 13 | 1912 Regulations relating to Elementary Agriculture and School Gardens, with a survey of the work in Ontario in 1911. |
| Circular 13A | 1912 *Children's Gardening. |
| Circular 13B | 1912 Teachers' Courses at the Ontario Agricultural College in Elementary Agriculture and Manual Training, Spring Term, 1912. |
| Circular 13C | 1912 Summer School for Teachers at the Ontario Agricultural College, July, 1912. |
| No. 1 School Chart 13D | 1912 Alfalfa or Lucerne. |
| Circular 13D | 1912 *Alfalfa or Lucerne. |
| No. 2 School Chart 13E | 1912 The Best Time to Sow Spring Grains. |
| Circular 13E | 1912 *The Best Time to Sow Spring Grains. |
| | 1908 Improvement of School Grounds. |
| | 1909 Plans for Rural School Buildings. |